DEPARTMENT OF THE ARMY
US ARMY CHEMICAL MATERIALS AGENCY
TOOELE CHEMICAL AGENT DISPOSAL FACILITY
11620 STARK ROAD
STOCKTON, UTAH 84071

REPLY TO
ATTENTION OF:

HAND DELIVERED
06.01434
APR 11 2006

UTAH DIVISION OF
SOLID & HAZARDOUS WASTE

April 11, 2006

Tooele Chemical Agent Disposal Facility PM-60222

SUBJECT: Revised Area 10 Mustard Ton Container Sampling Scheme

Mr. Dennis Downs, Director
Utah Department of Environmental Quality
Division of Solid and Hazardous Waste
288 North 1460 West
Salt Lake City, Utah 84116-0690

Dear Mr. Downs:

Reference letter, PM-60118, J. R. Majestic, Jr. and T. A. Ryba, Jr. to D. Downs, February 27, 2006, subject: Area 10 Mustard Ton Container Sampling Scheme.

Enclosed for your review and approval is a revised sampling plan pursuant to paragraphs 2.2.1.3.2 and 2.2.1.3.3 of the TOCDF Resource Conservation and Recovery Act (RCRA) Permit. The plan has been revised to address comments discussed with the State of Utah in a meeting on April 7, 2006. Also attached is a summary of the responses to the comments.

If you have any questions regarding this issue, please contact Ms. Elizabeth A. Lowes at (435) 833-7832 or Mr. Trace Salmon at (435) 833-7428.

Sincerely,

Gary W. McCloskey
EG&G Defense Materials, Inc.
*CERTIFICATION STATEMENT

Thaddeus A. Ryba, Jr.
TOCDF Site Project Manager
*CERTIFICATION STATEMENT

Copies Furnished:

CMA Risk Management Directorate (Mr. Stang)
DCD Risk Management Directorate (Mr. Levi)
TOCDF FO Representative (Ms. Snow)
File

* I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS

Tooele Chemical Agent Disposal Facility (TOCDF)

Area 10 Sampling Program

April 10, 2006
Revision 1

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1. INTRODUCTION

1.1. Background

The mustard munitions stored at Deseret Chemical Depot (DCD) include 6,397 HD-filled Ton Containers (TCs); one H-filled TC; 54,663 H-filled 155-mm projectiles; 885 HD-filled 4.2-inch mortars; and 62,524 HT-filled 4.2-inch mortars. This effort – the Area 10 Sampling Program – is limited to the mustard-filled TCs.

The 6,398 mustard TCs stored at DCD are divided into 211 lots. The only current available information on the mustard TCs is the lot numbers and the serial numbers ("D" numbers) of the TCs in each lot. All TCs are considered as one population because of the lack of additional information.

Initial characterization of the DCD mustard TC stockpile was conducted in 2003. The Mustard Characterization Project (EG&G, 2004) covered 98 distilled mustard TCs that were sampled and analyzed. This project identified the presence of mercury in liquid mustard and mustard heels in some TCs at levels that would impact processing rates at the TOCDF.

The Mustard Sampling Validation Project (EG&G, 2005) demonstrated that a single sample of the liquid mustard from a TC is adequate to identify mercury concentrations less than 1 mg/kg in the liquid. In addition, the results of this project demonstrated that if mercury concentrations in the liquid mustard are less than 1 mg/kg, the concentrations of mercury in the solid phase (heel) should be less than 25 mg/kg. The State of Utah, Division of Solid and Hazardous Waste (DSHW) has accepted this approach for mustard in TCs with mercury concentrations less than 1 mg/kg in the liquid mustard (DSHW, 2005).

The Area 10 Sampling Program will be conducted by TOCDF personnel in two Area 10 igloos that have been specifically designed and equipped to accommodate this sampling program. The general approach involves receipt of mustard TCs from Area 10 personnel, inspection of TCs for leaks or scabs, verification of the TC "D" numbers, preparation of TCs for sampling, placement of the TCs in a glovebox, collection of liquid samples from the TCs, measurement of heel levels in the TCs, followed by deconning, monitoring, and returning the TCs to storage in Area 10.

1.2. Objectives

The objectives of the Area 10 Sampling Program are to 1) collect a single liquid mustard sample from each mustard TC stored at DCD, analyze each sample for Health Risk Assessment (HRA) metals, identify those mustard TCs that contain mercury at concentrations of less than 1 mg/kg; and 2) determine the heel depth profile for each TC. Accordingly, the mustard TCs will be segregated in storage based on mercury concentrations and heel depth profiles to optimize future processing at TOCDF.

1.3. Organization

As co-permittees of TOCDF, the Chemical Materials Agency (CMA), DCD, and EG&G Defense Materials (EG&G) have shared interest and responsibilities for this sampling program. CMA has oversight responsibility of the program. DCD will allow TOCDF operators access to the Area 10 igloos to conduct sampling operations. DCD will heat and deliver mustard TCs to the igloos for sampling, and will return the mustard TCs into storage after sampling. EG&G/Battelle will perform all other actions associated with this program, including but not limited to sampling/analysis, and data generation, verification, reduction, reporting, and storage.

The TOCDF/EG&G Area 10 Sampling Manager has overall Project Management responsibility for the sampling program.

1.4. Changes to the Plan

To ensure that test objectives and quality standards are met, this plan will be implemented as written. Only TOCDF/EG&G Area 10 Sampling Manager or his/her designee may approve deviations from or changes to this plan.

2. SAFETY CRITERIA

All work will be performed in accordance with (IAW) applicable U.S. Army regulations and the TOCDF System Safety Program Plan. In addition samples will be collected and analyzed IAW applicable TOCDF Standard Operating Procedures (SOPs) and Laboratory Operating Procedures (LOPs).

3. SAMPLING STRATEGY

3.1. Sampling Objectives

The objectives of this program are to 1) collect a single liquid mustard sample from each mustard TC stored at DCD, analyze each sample for HRA metals, and identify those mustard TCs that contain mercury at concentrations of less than 1 mg/kg; and 2) determine the heel depth profile for each TC.

3.1.1. Statistical Objective

The statistical objective of this program is to determine the mercury concentration for 100 percent of the 6,398 mustard TCs stored at DCD.

3.1.2. Sampling Accuracy

Sampling accuracy will be achieved by sampling each mustard TC in a consistent manner as defined by TE-SOP-202.

3.1.3. Collection of Liquid Mustard Samples

The DSHW will be notified at least 72 hours in advance of the initiation of Area 10 sampling operations. Mustard sampling operations will be conducted in two igloos in Area 10 that have been specifically designed and equipped to accommodate this sampling program. The two igloos have been equipped with three identical TC gloveboxes where the samples will be collected from the TCs.

EG&G Area 10 Sampling Operators will collect a single 1 mL liquid mustard sample from each mustard TC and prepare the samples for transport to the Chemical Assessment Laboratory (CAL) for analysis. Sample collection will be conducted IAW TE-SOP-202.

The mustard TCs will be heated by DCD per DCD procedures prior to delivery of the TCs to the sampling igloos.

After confirmation that the portable filter hoods are working properly, mustard TCs will be received from Area 10 and placed on the prep station. The TCs will be positioned such that the heel weather mark is toward the bottom, the storage arrow marked by Area 10 is visible at the top, and the "working" plug is at the top. Preparation of the TCs will consist of positioning a portable filter hood over the TC, preparation of a smooth surface around the "working" plug, preparation of a clean surface at the bottom rim of the TC where potential spills may occur, cleaning residual dust/debris from the face of the TC, and attaching a pre-printed TC serial number sticker such that it can be read by the Operator.

Prior to placement in the glovebox, the Sampling Operators will measure and record the external temperature of each TC to ensure the temperature is at least 62 °F. If the temperature is less than 62 °F, the TC will be returned to Area 10 for additional heating.

After preparation, the TCs will be placed in the gloveboxes with the "working" plug at top dead center. The glovebox will then be sealed and verified to be at negative pressure relative to the room pressure. The TCs will be opened using the relief device (RD) that is sealed over the "working" plug. The RD allows the TC plug to be removed while controlling the release of any pressure that may exist in the TC.

After opening the TCs, a single 1.0 mL liquid mustard sample will be collected using new syringes and tubing placed through the TC plug hole and into the liquid mustard. The samples will be transferred to vials, lids sealed on the vials, vials placed in overpacks, and transferred to the glovebox airlocks. After each sample is collected, the sampling equipment (syringe and tubing) will be placed into the TC through the TC plug hole. Information regarding each mustard TC and sample collected will be recorded on a Glovebox Operations Worksheet.

The overpacked samples will be stored in the glovebox airlocks until sampling has been completed for the remaining TCs in the igloo gloveboxes. After sampling has been completed, the overpacked samples will be removed from the glovebox airlocks and placed in silver bullet containers that are then placed in buckets filled with absorbent in preparation for transport. DA Form 4508 will be completed to document and transfer sample chain-of-custody from the

Sampling Operator to the Monitoring personnel who will transport the samples to the CAL. The Monitoring personnel will then transport the samples to the CAL for receipt, logging, storage, and analysis.

3.1.4. Heel Depth Determination

After collection of the liquid mustard sample, a heel depth determination device will be used to measure the profile of the heel in each mustard TC. Measurements will be taken by inserting the measurement probe through the TC plug hole using a guide tube, positioning the probe at three predetermined measurement points and recording the heel depth on the Glovebox Operations Worksheet. After measurement of the heel, the measurement probe and guide tube will be pushed into the TC and the TC sealed with a new Teflon® tape wrapped plug.

3.1.5. Sample Transport

TOCDF Monitoring personnel will transport the overpacked sample containers to the CAL IAW TE-SOP-202. Prior to sample transport, Monitoring and CAL personnel will coordinate to ensure that the CAL agent storage limit will not be exceeded.

3.1.6. Sample Receipt and Storage

At the CAL, a trained and authorized individual will receive, log, and store the samples IAW TE-LOP-584. A visual observation of each sample will be made and the results recorded to capture the color, consistency, and number of phases for each sample.

3.1.7. Sample and Analytical Waste Disposal

Sample and analytical residues will be managed IAW TE-LOP-553.

3.1.8. Sampling Records

Collection of each liquid mustard sample will be documented by an Operator or Reader/Checker on a Glovebox Operations Worksheet as required by TE-SOP-202. Information collected will include:

- Operator Name
- Sample Collection Date
- Igloo Number
- Glovebox Number
- TC "D" Number
- Sample Collection Time
- Sample ID Number
- TC Temperature
- TC Heel Measurements

3.2. Analytical Procedures

3.2.1. Applicable Quality Assurance Program Plans

The TOCDF Participant Quality Assurance Plan (PQAP) (CDRL 22) and the TOCDF Laboratory Quality Control Plan (LQCP) will be followed for this program. The revisions of these documents current at the time of sample collection and analysis will apply.

3.2.2. Laboratory Operating Procedures

The liquid mustard samples and associated QC samples will be prepared, analyzed, and reported IAW TE-LOP-557, Analysis of Metals by ICP-MS. The revision of this document current at the time of sample analysis will apply

3.2.3. Analytical Samples

The CAL will be responsible for the preparation of QC samples and analysis of liquid mustard samples collected in Area 10. One liquid sample will be collected from each mustard TC stored at DCD (6,398 samples in total) and analyzed for HRA metals under this program. Field duplicate samples will be collected at a frequency of once per week for the first four weeks of the sampling program and once per month thereafter for the remainder of the sampling program.

Laboratory QC samples will include Interference Check Samples (ICS), Continuing Calibration Blanks (CCB), Continuing Calibration Verification Solution (CCV) samples, Preparation Blank samples, Dilution Test samples, Post-digestion Spike (PDS) samples, Laboratory Control Samples (LCS), Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples, and sample duplicates. The CAL will prepare and analyze laboratory QC samples at the frequencies outlined in Section 4.

3.2.4. Method Detection Limits (MDLs) and Practical Quantitation Limits (PQLs)

The MDLs and PQLs for the target metal analytes are summarized in Table 1. These values are based on the MDL study conducted January 13, 2006. Actual MDLs and PQLs for the liquid mustard samples will be dependent on the sample weight, preparation dilution factor, and mustard density. These values may change as new MDL studies are conducted.

Table 1.
MDLs and PQLs for Target Metal Analytes

Metal	MDL[1] (mg/kg)	PQL[1] (mg/kg)
Aluminum	8	40
Antimony	0.048	0.24
Arsenic	0.24	1.2
Barium	0.16	0.8
Beryllium	0.032	0.16
Boron	8	40
Cadmium	0.04	0.2
Chromium	0.8	4
Cobalt	0.024	0.12
Copper	0.8	4
Lead	0.16	0.8
Manganese	0.08	0.4
Mercury	0.12	0.6
Nickel	1.2	6
Selenium	1.2	6
Silver	0.08	0.4
Thallium	0.08	0.4
Tin	0.4	2
Vanadium	0.16	0.8
Zinc	1.6	8

[1] These are approximate MDL and PQL values. The actual MDLs and PQLs for the samples are dependent on the sample weight, preparation dilution factor, and actual mustard density.

3.3. Instrument Calibration

Prior to analysis, instrument calibration status will be verified IAW TE-LOP-557. If necessary, instruments will be calibrated (or recalibrated) IAW Table 2.

Table 2.
Instrument Calibration

Standard/Sample ID	Acceptance Criteria
Calibration	Average of at least 3 runs
Initial Calibration Verification (ICV)	Results ±10% of initial calibration
Initial Calibration Blank (ICB)	Response <3 times IDL

4. QUALITY ASSURANCE AND REPORTING

4.1. Quality Control Objective

The overall quality control objective is to ensure generation of accurate analytical data that may be used to identify which DCD mustard TCs have mercury concentrations less than 1 mg/kg in the liquid mustard.

4.1.1. QC Samples

The types of QC samples that will be used to document the validity of the data generated from this program are described below:

- Interference Check Solution (ICS) – A standard solution analyzed IAW TE-LOP-557 to demonstrate the magnitude of interferences from known concentrations of interfering elements, and to provide a test of any corrections.

- Continuing Calibration Blank (CCB) – A standard solution that contains the same acids and concentrations and the same internal standards and concentrations as the calibration standards.

- Continuing Calibration Verification (CCV) – A standard solution analyzed IAW TE-LOP-557 to demonstrate the instrument calibration remains acceptable.

- Preparation Blank – Acids and other reagents used during sample preparation that are carried through the entire sample preparation and analysis method using the same reagents and volumes as is done for the samples.

- Dilution Test – Dilution test results will be evaluated if the analyte concentration is within the linear dynamic range of the instrument and is greater than 100 times the instrument detection limit (IDL) for any target analyte. An analysis of a fivefold (1+4) dilution must agree to within ±10% of the original determination. If not, an interference effect must be suspected.

- Post-digestion Spike (PDS) – An analyte spike added to a portion of a prepared sample, or its dilution, that should be recovered to within 75% to 125% of the known value or within the laboratory derived acceptance criteria.

- Laboratory Control Sample (LCS) - The LCS is carried through the entire procedure from sample preparation through analysis as if it were a field sample. The purpose of the LCS is to evaluate bias of the method.

- Matrix Spike (MS) – A liquid mustard sample spiked with the multi-element matrix spike solution.

- Matrix Spike Duplicate (MSD) – A duplicate liquid mustard sample spiked with the mult-element matrix spike solution.

- Sample Duplicate – A split of a liquid mustard sample (generated at the CAL) used to provide estimates of precision for sample results that are >100 IDL.

- Field Duplicate – Independent samples which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. These duplicates are useful in documenting the precision of the sampling process.

4.2. QC Requirements

A summary of analytical quality requirements for the Area 10 Sampling Program is presented in Table 3. QC results outside of the control limits will be addressed as outlined in Table 3 and IAW TE-LOP-557.

4.2.1. Precision

Precision is defined as the degree of mutual agreement among individual measurements made under prescribed conditions. The precision goals are included in Table 3.

Precision will be calculated for laboratory duplicate analysis using the following equation:

$$RPD = \left[\frac{|X_1 - X_2|}{\left(\frac{X_1 + X_2}{2} \right)} \right] \times 100$$

Where: RPD = Relative Percent Difference
X_1 = Analytical Result of Sample
X_2 = Analytical Result of Duplicate

4.2.2. Accuracy

Accuracy is the degree of agreement of a measurement to an accepted reference or true value. The accuracy will be determined from analysis of samples spiked with a known concentration. Accuracy objectives have been set and are presented in Table 3. The formula which will be used to assess the accuracy of the laboratory QA/QC data (e.g., matrix spike analysis) is as follows:

$$\%R = \left(\frac{(Qss - Qus)}{Qs} \right) \times 100$$

Where:
- $\%R$ = Percent recovery
- Q_{ss} = Quantity of Analyte Found in the Spike Sample
- Q_{us} = Quantity of Analyte Found in the Unspiked Sample
- Q_s = Quantity of Added Spike

4.2.3. Completeness

Completeness is defined as the amount of valid data from a measurement system compared to the amount that was expected under optimal normal conditions. Completeness should be 100%.

While only a single 1 mL sample will be collected from each TC, not all of the sample will be consumed during analysis. If the results of the initial analysis are not acceptable for any reason, the remaining portion of the sample will be analyzed.

Completeness will be reported as the percentage of all measurements judged to be valid. Every attempt will be made to ensure that all data generated will be valid data. If data appears questionable based on circumstances that occurred or were observed during either the field sampling or laboratory analyses (i.e., sampling or analytical methods were not followed, unreasonable results, or equipment), it will be flagged and an explanation provided.

Table 3.
Summary of QA/QC Criteria for Liquid Mustard Samples

Quality Parameter	Method/Frequency	Criteria	Corrective Action
ICS	Beginning of analytical run or once every 12 hours, whichever is more frequent	70% to 130% recovery.	Take corrective action per TE-LOP-557.
CCB	At least once every 10 analytical samples	Response < 3 times IDL	Take corrective action per TE-LOP-557.
CCV	At least once every 10 analytical samples	Results ± 10% of initial calibration	Take corrective action per TE-LOP-557.
Preparation Blank	At least once every 20 analytical samples	< PQL	Take corrective action per TE-LOP-557.
Dilution Test	At least once every 20 analytical samples	Within ±10% of original determination where elements are found within the linear calibration range of the instrument for both the parent and the dilution.	Take corrective action per TE-LOP-557.
PDS	At least once every 20 analytical samples	75% to 125% recovery.	Take corrective action per TE-LOP-557.
LCS	At least once every 20 analytical samples	± 25% of spike amount	Take corrective action per TE-LOP-557.
MS	At least once every 20 analytical samples	± 25% recovery	Take corrective action per TE-LOP-557.
MSD	At least once every 20 analytical samples	≤ 20% RPD	Take corrective action per TE-LOP-557.
Sample Duplicate[1]	At least once every 20 analytical samples	≤ 20% RPD if response >100 IDL	Take corrective action per TE-LOP-557.
Field Duplicate	Once per week for the first four weeks of the sampling program; Once per month thereafter	≤ 25% RPD if response >100 IDL	Check Calculations. Assess Impact on Data
Holding Time	Every sample	28 Days (Mercury) 6 Months (All other metals)	Resample

[1] Sample duplicate will consist of a split made at the CAL from a single liquid mustard sample.

4.2.4. Representativeness and Comparability

Representativeness is defined as the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, process condition, or an environmental condition. Comparability is defined as expressing the confidence with which one data set can be compared to another.

It is recognized that the usefulness of the data is also contingent upon meeting the criteria for representativeness and comparability. Representativeness will be ensured by consistent use of standard sample collection, sample storage, sample packaging, sample transport, and laboratory subsampling procedures. Comparability will be ensured by using standard analytical methods and procedures, and QC and sample duplicates.

4.2.5. Data Review and Verification Requirements

Data verification is the process of accepting or rejecting data on the basis of established criteria. The QC personnel will use verification methods and criteria appropriate to the type of data, even those judged to be an "outlying" or spurious value. The persons verifying the data will have sufficient knowledge of the sampling and analytical methods to identify questionable values and deviations from criteria specified in relevant SOPs, LOPs or the TOCDF LQCP.

QC personnel, using criteria outlined in this document and applicable SOPs and LOPs, will verify analytical and sampling data. The results from the laboratory QC samples will be used to further verify analytical results. QC personnel will perform review of items from the Sample Analysis Management Form, associated sampling records, analytical instrument raw data, Chains of Custody, and analytical reports to verify completeness and accuracy of the data. Calculated results will be provided by software that is validated and controlled.

The following criteria will be used to evaluate the field sampling data:

- Use of approved sampling procedures.
- Proper sampling per the SOP.
- Use of properly operating and calibrated equipment.
- Proper sample traceability maintained.

The criteria listed below will be used to evaluate analytical data:

- Use of approved analytical procedures.
- Use of properly operating and calibrated instrumentation.
- Precision and accuracy achieved should be comparable to that achieved in previous analytical programs and consistent with the objectives stated in the TOCDF LQCP.

4.2.6. Documentation and Records

Analytical results for individual samples will be generated and reported IAW TE-LOP-557, and will be filed by EG&G for future reference.

Personnel will use standardized forms to ensure completeness, traceability, and comparability of the process information and samples collected. A second person will conduct field checks of the standardized forms and records to ensure accuracy and completeness. Verification will be documented.

4.2.7. Reports To Management

If any corrective action is required during the program, these actions will be reported immediately to the TOCDF/EG&G Area 10 Sampling Manager. If the TOCDF/EG&G Area 10 Sampling Manager determines that an sampling event should be repeated, the decision will be made at that point and will be communicated to those involved.

4.2.8. References

EG&G Defense Materials, Mustard Characterization Project Report for Deseret Chemical Depot Mustard Ton Containers, January 14, 2004.

EG&G Defense Materials, Mustard Sampling Validation Report, January 2005.

State of Utah, Division of Solid and Hazardous Waste, Mercury Sampling in Mustard Ton Containers, June 2, 2005

Comment Response Summary
Area 10 Mustard Ton Container Sampling Scheme

1. Comment: The one Misc lot ton container and the four dd- tons should be handled separately.

   Response: At least one ton container (TC) from each of these lots was sampled as part of the Mustard Characterization Project. Data provided in the characterization report indicates that these TCs falls in line with the range of constituents found for the rest of the samples. Therefore, there is no need to treat these TCs any differently than the rest.

2. Comment: The sampling plan needs to include ton heating, monitoring, sample storage, chain of custody requirements, and heel depth determinations.

   Response: Language has been included in the plan to describe ton heating as it relates to the TOCDF sampling operation. Initial heating of the TC is performed by the Deseret Chemical Depot (DCD) per DCD procedures. Language has been added to the TOCDF Sampling Scheme to reflect requirements for verifying the TC skin temperature before it is placed within a sample glove box. The glove box air is maintained at a temperature of approximately 70 degrees F, which will ensure that the TCs will be maintained at a temperature consistent with the TC temperatures from the previous TC characterization and validation studies. Additional language has also been added to the sampling scheme to explain in more detail sample storage, chain of custody, and heel depth determination processes. Details on monitoring processes have not been included in the Sampling Scheme, as this information is not pertinent to the scope of the document. Monitoring practices for the Area 10 sampling facilities are consistent with TOCDF monitoring processes, in compliance with site and Army requirements.

3. Comment: Section 1.1, 4th paragraph – the narrative should state less than, not less than or equal to, 1ppm.

   Response: The document has been revised to address this comment.

4. Comment: Section 3.1 – Another objective of the sampling plan is to determine the heel size to place ton containers into categories. Please discuss throughout the document.

   Response: The document has been revised to address this comment.

5. Comment: Section 3.1.5 – Specify how many vials of agent the CAL can store at one time.

Response: Language has been added to the plan to indicate that operations will be conducted to ensure that CAL surety requirements, with respect to limitations on agent quantities present, will be maintained.

6. Comment: Section 3.1.7 – Specify visual description.

   Response: Language will be added to the plan to indicate that a visual description (e.g., color, consistency, phases) of the sample will be documented at the CAL in accordance with LOP-584.

7. Comment: Section 3.2.1 – Specify where the TOCDF Participant Quality Assurance Plan (PQAP) can be located.

   Response: The document has been revised to address this comment.

8. Comment: 3.2.2 – Specify the monitoring requirements for Igloo Sampling. Specify the LOPs which will be used for this sampling procedure.

   Response: See the response to comment number 2 with respect to monitoring. To address the question pertaining to a sampling procedure, language has been added to the plan to reference TE-SOP-202 "Area 10 Sampling Facility – Mustard Sampling". Please note that such referencing of procedures within this plan does not suggest that these procedures are "permit controlled" documents, such that they would require DSHW approval for any change. Should TOCDF change sampling processes that affect requirements as reflected in the Sampling Scheme, TOCDF will notify DSHW and obtain approval as deemed necessary by DSHW.

9. Comment: Section 3.2.3 – Field duplicates are required.

   Response: The Plan has been modified to require one field duplicate sample per week for the first four weeks, followed by one field duplicate sample per month for the remainder of the sampling process.

10. Comment: Specify the sample holding time.

    Response: The document has been revised to address this comment.

11. Comment: Provide sample collection forms.

    Response: A copy of the draft procedure, which includes the sample collection form, will be provided to DSHW.

12. Comment: Provide information if there is more than one phase (2 phases) in the collected sample.

    Response: See response to comment number 6.

13. Comment: Provide carbon filter information.

Response: The Engineering Change Proposal documentation for the backup filter unit for Area 10 was electronically provided to DSHW.

14. Comment: Describe how samples will be collected.

Response: More detail on the sample collection processes has been added to the document.

15. Comment: Put in the clearance criteria for samples and TCs.

Response: Clearance criteria for samples and TCs is not required to be included in the Sampling Scheme, since it does not pertain to data quality. Criteria for releasing samples and TCs from the glove boxes are included in the sampling SOP. Samples and TCs will be cleared from the glove boxes at 0.5 VSL. Area monitors within the igloo will be used to clear TCs from the igloo. Should an area monitor reading exceed 0.2 STEL, the TCs will not be released for transfer back to DCD for storage.

16. Comment: Describe how the samples will be stored prior to extraction.

Response: The document has been revised to indicate that after samples are collected and overpacked, they will be stored in the glovebox airlocks until remaining TCs in the igloo are sampled. Section 3.1.6 of the document addresses storage of the samples after transport to the CAL.

17. Comment: The mustard temperature should be verified to be similar to the mustard temperature during the sampling validation study.

Response: See response to comment number 2.

18. Comment: Put field QC requirements into the plan.

Response: See response to comment number 9 with respect to field duplicates. Equipment blanks were deemed to be unnecessary since new sampling equipment will be used for each TC sampling event.

19. Comment: Describe how ton container gas pressure will be measured and vented.

Response: Gas pressure will not be measured. TCs will be vented in a controlled manner within the glove box to address the hazard associated with the potential for hydrogen gas pressure buildup. Venting procedures are included within TE-SOP-202. The venting procedures include a gradual bleeding of air pressure into the glove box, while monitoring explosive limits within the glove box to ensure that an explosive environment is not created.

20. Comment: Is there an explosive hazard from the hydrogen?

Response: The explosive hazard associated with the potential for hydrogen buildup within the TCs has been addressed with engineered controls and procedures as described in comment number 19, above.